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SCIENCE NEWS LETTER

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JUL 24 1944

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 22, 1944

Perpetual Cold

See Page 56

A SCIENCE SERVICE PUBLICATION

IT MUSTN'T bite the hand that throws it

THIS IS A HAND GRENADE. When you pull the firing pin and release the lever you have only the length of time it takes the fuse to burn down to get rid of it or get away from there—and that's only a handful of seconds!

If you made hand grenades, or used them, you'd want to be mighty sure about those fuses.

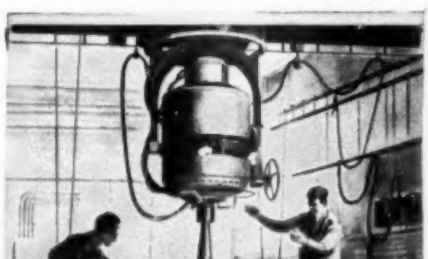
You can be. The fuse of this grenade, and thousands of others just like it, was individually X-rayed while passing down a production line at the rate of 4000 an hour. When a bad fuse showed up, something equivalent to the signal for a four-alarm fire took place. A bell rang, a red light flashed, the bad fuse was automatically daubed with red paint, and finally, to make assurance doubly sure that the bad fuse didn't slip through, it was recorded on the chart of a photoelectric meter.

From sorting oranges for California fruit growers to sorting hand grenades is quite a step—but it is typical of the new wartime jobs G-E scientists and engineers have put X rays to work on. It is also typical of the application of G.E.'s peacetime research and engineering to war.

Nearly thirty years ago Dr. William D. Coolidge, now G-E vice-president and Director of the Research Laboratory, developed the Coolidge X-ray tube—one of the most important developments of all time in science and medicine. In the years that followed, he and other scientists and engineers worked steadily to improve this almost magical tool of research and healing.

Then came the war, and the X ray in its latest and most powerful form became almost overnight a vital tool of war production, testing for hidden flaws no human eyes could reveal the metals on which the strength and endurance of our arms depend.

Which makes the X ray another good example of the way G-E research and engineering work to meet America's needs—constantly, in unexpected ways—in war and peace. *General Electric Co., Schenectady, N.Y.*



The G-E million-volt X ray cuts from hours to minutes the time required to examine metal parts—from airplane crankshafts to turbine shells.

Hear the General Electric radio programs: "The G-E All-Girl Orchestra" Sunday 10 p.m. EWT, NBC—"The World Today" news, every weekday 6:45 p.m. EWT, CBS.

GENERAL ELECTRIC

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BUY WAR BONDS

CHEMISTRY

Two New B Vitamins

Closely related to pyridoxine, these two may bring greater understanding of the role of vitamin B_6 in nutrition and health.

➤ GREATER understanding of the role of vitamin B_6, or pyridoxine, in nutrition and health may come from the discovery and synthesis of two new B vitamins closely related to pyridoxine, it appears from an announcement from the University of Texas.

The new vitamins, pyridoxamine and pyridoxal, are reported by Dr. Esmond E. Snell, of the University's Biochemical Institute, in the *Journal of Biological Chemistry* (June). The final synthesis of the vitamins was carried out in the research laboratories of Merck and Company by Dr. S. A. Harris, Dr. Dorothea Heyl and Dr. K. Folkers, who collaborated with Dr. Snell in the last phases of the problem.

The new vitamins were discovered because they are several thousand times as active in promoting growth of certain bacteria as is pyridoxine. They appear to make up an important part of the vitamin B_6 activity of plant and animal tissues. That such compounds existed in natural materials was discovered as early as 1941; their nature was at that time unknown, and they were tentatively called "pseudopyridoxine."

Pyridoxine has been found necessary for growth and health of all animals so far investigated. It is effective in treating anemia in rabbits, dogs, and hogs, in maintaining the nervous tissue of hogs, and in reducing oiliness of skin in some cases of human acne. The role of pyridoxine in nutrition and health has not been clear, however, and some of the possibilities opened up by the new discovery are being investigated further with the hope that the functioning of vitamin B_6 may be clarified.

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OCEANOGRAPHY

Harvesting the Sea

Five factories are hauling in tons of kelp from the coast of southern California and extracting the salts and gels which formerly came from Japan.

➤ HARVESTING the sea for its salty crop of useful seaweeds is a war-fostered enterprise with a promising future, declares Dr. C. K. Tseng, of the Scripps Institution of Oceanography (*Scientific Monthly,* July).

Five factories now, where there was only one before the war, are hauling in tons of kelp from the southern California coast and extracting the salts and gels our industries used to get from Japan. Great masses of seaweed stalks a hundred feet long are being mowed off Maine and California coasts for their yield of algin salts, good for emulsifying agents in camouflage paints, fireproofing, and latex coating for signal wires.

Regard for future national defense should lead our government to give the growing seaweed business a permanent status, and not let it sink back into 90% dependence upon Japanese supplies after the war, advocates Dr. Tseng, a seaweed diver himself.

The seaweed product most in need of government-sponsored research on cheaper methods of manufacture, Dr. Tseng believes, is agar, a kind of vegetable gelatin which the government is now buying at three dollars a pound for use in wound dressings, in bacteriological laboratories, in developing photographs and in manufacturing ice cream.

Using only 50,000 out of the 30,00,000 tons of marine crops which scientists estimate are available off Point Conception, Calif., the seaweed industry is worth annually $2,000 000 to California now. The thousands of pounds of agar, algin and carragenin used in a peacetime year to give a creamy-smooth texture to chocolate malted milk, ice cream, and candies and the hundred thousand pounds used as a moisture-guarding ingredient in bakery products are pointed out by Dr. Tseng as reasons why the seaweed industry merits improvement now to prepare it for the return of Japanese competition later.

The high food value of seaweeds is not something we should leave for the thrifty Orientals to thrive upon, warns Dr. Tseng. The rich supply of potassium chloride which the Japanese and Chinese get from their kelp diets is suggested by the seaweed specialist as the factor responsible for the complete absence of hay-fever cases in the Orient.

Because it furnishes vitamins and minerals, especially goiter-curing iodine, seaweed should have its place among common vegetables like cabbage and tomatoes, Dr. Tseng recommends.

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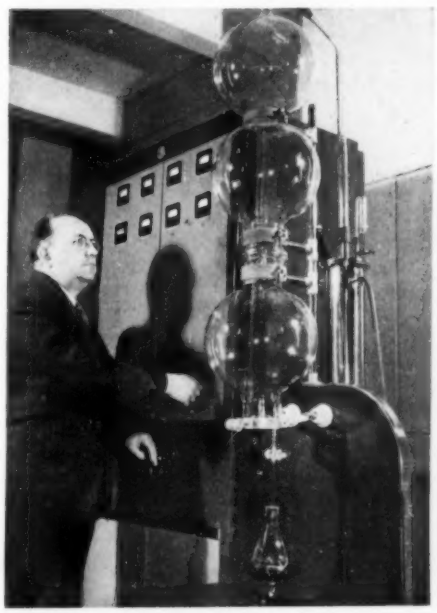
RADIO-PHARMACY

Radio Dries Penicillin Much Faster Than Old Way

➤ A METHOD of using radio heat for drying penicillin, accomplishing this step 48 times as fast as the present "freeze-drying" method, has been developed by Dr. George H Brown, research engineer of the Radio Corporation of America. (*Turn to next page.*)



***SAVES TIME**—Life-saving penicillin is produced much faster when the solutions are dried with this new electronic installation, shown with its inventor, Dr. George H. Brown, research engineer of RCA Laboratories.*

Tests of the electronic equipment made at the new E. R. Squibb penicillin production plant at New Brunswick, N. J., showed that in 24 hours enough penicillin could be dried to treat 4,000 patients each requiring 500,000 units of the germ-fighting mold chemical.

This drying of the penicillin is only one step in production, which starts with growing the mold and proceeds through extraction and purification processes. After purification, the penicillin is still in a solution with a potency of about 40,000 units per cubic centimeter. The objective is to attain 100,000 units per cubic centimeter. Since ordinary heat methods of evaporation destroy the effectiveness of the chemical, the bulk reduction has been accomplished by evaporation in a high vacuum at below freezing temperatures. Dr. Brown's electronic bulk-reducer uses radio frequency current to concentrate the penicillin solution.

Advantages for the electronic method besides the saving in time are given as: 1. Reduction in operating costs equivalent to the saving of one ton of dry ice a day or about $65 per 24 hours. 2. Reduction in maintenance costs. 3. Smoother flow of production. 4. Reduction in floor space requirements to about one-tenth. 5. Saving amounting to several hundred per cent of original investment. The RCA equipment is destined to be sold at a cost of about $6000 for a single unit.

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CHEMISTRY

Reversed Cyclotron

Cosmic rays may be slowed down and possibly put to work in explaining the secrets of the universe. Big obstacle is the fact that the rays choose their own directions.

➤ CATCHING COSMIC rays (in a different way from at present), slowing them down for study and perhaps putting them to work in explaining the secrets of the universe, is suggested by Prof. Laurence Ellsworth Dodd of the University of California at Los Angeles. The cyclotron, now used for speeding up the flight of atomic particles, would work in reverse for this operation.

It is theoretically quite possible, Dr. Dodd states, to reverse the usual cyclotron procedure so that rapidly traveling particles can be slowed down for investigation. The high-speed cosmic-ray ions that approach the earth from all directions would theoretically enter the cyclotron and could be stopped by it if it can be further developed to the point where it can emit particles of the same speeds as those of the cosmic rays.

The cyclotron gives tremendous speeds to particles by whirling them in an ever-increasing spiral between two electrodes which alternate their charges at high frequency. Even at its fastest, however, the cyclotron does not yet project particles with the higher speeds of cosmic rays, he stated, and some means of producing higher frequencies will have to be found before the cyclotron could act as a catcher for such rays. By varying present methods of studying these rays, further secrets of charged particles entering our atmosphere from outer space might be discovered.

A practical obstacle, not to reversing the cyclotron, but to its use for catching cosmic rays, is that cosmic rays have a way of choosing their own directions, and one might have to be content with pointing this ion-catcher in a fixed direction and with "waiting for something to turn up." Cosmic rays are charged particles of exceedingly high energy running into billions of electron-volts which enter the earth's atmosphere and produce other high-speed particles whose velocities may approach that of light.

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ORDNANCE

Grenades Now Launched From the Garand Rifle

➤ GRENADES CAN now be launched from the Garand semi-automatic rifle, thus eliminating the need for Springfield rifles for this purpose in infantry units. The grenade launcher prevents the gases generated by the powder charge from operating the Garand's bolt mechanism with the resultant risk of injury to the bolt.

The new development was devised by Ray S. Miller, Army Ordnance civilian armament foreman at Fort Benning, Ga.

Prior to Mr. Miller's invention, it was necessary to use both Springfield and the Garand rifles, in order to have adequate fire power and a grenade launcher as well. With the new device, the Garand can be used interchangeably as a grenade launcher or semi-automatic rifle.

Grenades for use with the Garand launcher include the anti-tank grenade, hand fragmentation grenade, the familiar pineapple hand grenade and approximately 30 signal grenades.

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SCIENCE NEWS LETTER
Vol. 46 JULY 22, 1944 *No. 4*

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. armed forces overseas, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents, $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rate from U. S. to destination.

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Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STAte 4439.

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PALESTINE TERRACES—The land you see to the left has been washed off to bed rock; that on the right has been maintained, though farmed in a primitive manner. Five bushels to the acre is considered a good yield by natives. The proposed plan of irrigation would increase this yield greatly. This picture was taken by Dr. Walter C. Lowdermilk.

ENGINEERING

Jordan River Authority

Plans are formulated for the irrigation of 600,000 acres in postwar Palestine. Unique drainage of the main interior valley is the keystone.

➤ JORDAN'S WATERS, baptising into fruitfulness 600,000 acres of land now sterile or scant-yielding, are part of a vision of things to come in postwar Palestine that has been seen by a group of American scientists and engineers, the Commission on Palestine Surveys. A second part is the construction of a 95-mile chain of canals and tunnels, leading water from the Mediterranean down a 1300-foot drop to the Dead Sea, with great turbo-generator plants to exploit its power possibilities to the extent of more than a billion kilowatt-hours a year—more than ten times the electric power consumption of all Palestine at present.

Dr. Emanuel Neumann of New York City, a member of the Commission, disclosed some particulars of the project in an interview. The Commission has been at work for about 14 months, developing details of the plan, and there is still several months' work to do.

Details of the project are set forth in a chapter in a new book, *Palestine, Land of Promise,* by Dr. Walter C. Lowdermilk, assistant chief of the U. S. Soil Conservation Service. Dr. Lowdermilk drew up the basic outlines of the scheme; filling them in was the task of the Commission.

Key to the whole situation is the unique drainage of the main interior valley of Palestine. The Jordan river, a rapid fresh-water stream, flows into the intensely salt Dead Sea, lying 1,300 feet below sea level. Nothing flows out of the Dead Sea; it loses water only by evaporation.

If the precious fresh water of the Jordan is diverted for irrigation, the Dead Sea would in time dwindle and dry up, leaving at most a malignant salt marsh. To prevent this, the inlet from the Mediterranean is projected. It would let in enough water to replace the evaporation losses, generating power on the way downhill. It may be found advisable to raise the Dead Sea level somewhat, increasing its efficiency as a great evaporating pan.

The Dead Sea waters, under the plan, would also be "mined" for some of the minerals they contain—potash, bromine, asphalt, and especially magnesium. It is estimated that the dense brine contains some 22 billion tons of magnesium salts. It is also conjectured that there may be an oil pool under the sea bottom.

However, the real treasure is still the fresh water of the Jordan. It is hoped that the total irrigated acreage can be raised from the 600,000 at present projected to an eventual 750,000. The present project, however, is expected to make room and a living for between 100,000 and 120,000 families. The population of that historic land has nearly trebled in 25 years, from 500,000 in 1919 to 1,500,000 today; full realization of the Commission's hopes would in time permit this figure also to be trebled.

The project calls for many small dams and three larger ones, the latter ranging from 80 to 300 feet in height and from 1,200 to 8,500 feet in length. Main feeder canals, excluding laterals, will total 450 miles in length. All canals will be concrete-lined.

Water carried by the canals is expected to reach 750,000 acre-feet a year. Maior reservoirs will store a total of 900,000 acre-feet. Included in the storage system will be Lake Genesareth, or the Sea of Galilee. Changing of the lake level, however, is not contemplated, on account of its great historic significance.

In addition to making life better for more people in Palestine, the Commission hopes that their project, like the TVA and the Boulder Dam in this country on which it is modeled, will serve as a stimulus to similar undertakings in neighboring Near East countries. With proper irrigation and land management, Dr. Neumann stated, the Kingdom of Iraq could probably support a population of 25,000,000 instead of its present 4,000,000.

Capital investment for full development of the Jordan valley project would require, over a period of years, from $150,000,000 to $200,000,000. This can be raised in several ways, Dr. Neumann suggested. Some might come from the Government of Palestine. More would be raised by Jewish organizations, and additional sums put in by private investors. Finally, in the post-war returning of Nazi loot, property stolen from European Jews who were subsequently killed might with justice be assigned to the support of this great work of reclamation and restoration.

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Peruvian chemical industry is now manufacturing zinc oxide.

INVENTION

G. I. Inventions

Machines that save valuable man-hours and eyesight have been contrived by soldiers overseas from scrap and junk piles.

➤ THREE SOLDIERS now serving in the European theater have proved, by their recent inventions, that one of the most deadly weapons in modern warfare is brainpower. Technical Sergeant Richard J. Schmieder, 26-year-old Ninth Air Force Service Command machinist, has developed new equipment that saves hundreds of man-hours in getting aircraft back into the air after suffering battle-damage. Master Sergeant Walter M. Bakula and Sergeant Everett R. Van Cleave, stationed in Italy, have designed and built efficient duplicating machines for cutting metal from plate steel and scrap metal, otherwise considered useless.

FLAK PATCHES—An electric drill points to two flak holes (left). The one to the lower left has already been drilled out with a soldier-invented 1¾-inch self-centering circular saw. A fly-cutter and jig (center) used for cutting out flak hole patches in standard sizes is another soldier-created time-saver in repairing B-26 Marauder medium bombers. Final step (right) is begun when the patch is held to the fuselage by retainers and the pattern of the patch is drilled into the aluminum. Rivets will be inserted, and a technically perfect job of mending will be completed. These are official Army Air Forces photographs.

Time is an essential commodity in getting flak-pocked, bullet-scarred, battle-damaged B-26 Marauders back into the sky, so that they can continue to hammer at Nazi installations along the Normandy invasion coast. Each plane must be mended, in conformation with rigid Army Air Force specifications, before it can again take to the sky.

Sgt. Schmieder developed a circular saw that is operated by a mechanical hand drill, which performs an inspection-proof job of patching a flak hole in five minutes. By hand, the job takes over an hour. He merely selects a self-centering saw of sufficient diameter to exceed each flak-hole's greatest extremity, inserts the tip in the puncture and cuts out a clean, round, even aperture, just as you might core an apple. From an assortment of prefabricated aluminum patches, in dimensions to fit every saw-cut, he chooses the proper size, and rivets it fast.

Recently, battle tests indicated that it was necessary to install grillework in the engine nacelle doors of the B-26 Marauders to allow air to circulate within the cowling and let toxic fumes escape. New planes coming from the factory were equipped with this modification, but it had to be made on those already in the field. By hand, the job took two full man-days to each plane. Sgt. Schmieder constructed a punch press from scrap materials that does the job in 60 seconds—just one minute.

His other original developments include a long-handled torque wrench for dismounting and detaching engines from planes, a lord-mount jig, a broken spark plug remover, and a micromatic gun-sight hair scriber. For his job as a "fixer," Sgt. Schmieder received the Legion of Merit by order of Gen. Eisenhower.

The duplicating machines, developed by M. Sgt. Bakula and Sgt. Van Cleave, were constructed by them from a junk pile and a torch. One machine cuts a prescribed straight line, another cuts a circle, using an automatic cutting torch.

Their method saves the eyes of the operator from the constant strain of cutting with a hand torch, and speeds up the job, since the cutting is done at maximum speed throughout the operation. A job requiring 10 or 20 minutes of hard labor with a hand torch is accomplished by the new machine in five minutes. The smooth, even cut produced by the machine cannot be equalled by the steadiest hand.

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PUBLIC HEALTH

Sylvatic Plague Reaches As Far East as Oklahoma

➤ SYLVATIC PLAGUE, the form of this dreaded disease found in wild rodents, has penetrated to Oklahoma where plague germs were found in fleas from wood rats and mice, the U. S. Public Health Service in Washington reports.

Oklahoma is the farthest east this disease has travelled so far in its spread from the West Coast.

No human case has been reported so far this year.

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***ACETYLENE CUTTING MACHINE**—Sergeant Everett R. Van Cleave turns on the power to put his newly invented machine into action in this official Army Air Forces photograph. It follows any pre-determined pattern, and the edge of the material is perfectly smooth after it has been cut.*

PHYSICS

Fabric Measured by Sound

Elasticity of fabric thread is determined by causing it to vibrate like a string of a violin. Method is not new, but developments have made it commercially usable.

➤ CAUSING fabric thread to vibrate like a string of the violin with sound waves passing through it, is the basis of a method for determining its elasticity, a property important particularly to manufacturers of girdles, garters and garments that must possess stretchability. The method is not entirely new, but recent developments make it now commercially usable. They result from the work of two scientists of E. I. du Pont de Nemours and Company, Dr. J. W. Ballou and Dr. Shirleigh Silverman.

The elasticity of the thread or yarn must be taken into consideration in adjusting the loom or knitting machine before fabrication is started. The older stretching-by-weight method often produces permanent deformation. The new method does not, because in it a small force is applied rapidly and stretches the material so little and so quickly that it does not have time to get out of shape. It is the sound waves passing rapidly through the material that cause the rapid stretching and recovery as the thread or yarn vibrates.

In the new method the test fiber is fastened to one end of a steel bar about eight inches long. The other end is strung over a pulley and held taut with a weight. A radio tube audio oscillator is turned on and sets up vibrations in the steel bar at the ten-kilocycle frequency (10,000 cycles per second), causing the bar to give out a very high note. The sound energy passes along the test fiber and causes it to vibrate. The wavelength of these vibrations is accurately measured with a sliding crystal. From the wavelength and the frequency, which is already known, the velocity of the sound is calculated. By what physicists call Young's modulus of elasticity, the elasticity then becomes known.

MEDICINE

Army Uses Benzedrine Only When Necessary

➤ YOU NEED not worry that your man in the service who may be given a "benzedrine alert" to ward off a "sleep crisis" is in danger of nervous breakdown from overdosage. As explained by Maj. Gen. David N. W. Grant, the Air Surgeon, in a recent report to *Air Force*, official service journal of the U. S. Army Air Forces, distribution of benzedrine is in the hands of the medical officers.

These officers issue only the amount of benzedrine required in a particular situation, issue it only when absolutely necessary, and see to it that the men get a long enough sleep after a "benzedrine alert" to relieve completely the accumulated fatigue.

These medical officers know that benzedrine is no substitute for sleep and rest. The fact should be remembered by the lay person, young or old, who may be tempted to take the drug so he can stay awake to cram for an examination or to crowd into an already full day a few more hours of social or business activities.

"In time of war," General Grant states, "combat conditions frequently require men to remain on active duty long after the desire for sleep tends to overpower the demand for wakefulness.

"The importance of the 'sleep crisis' may be appreciated if one remembers that military success depends not only upon the arrival of enough men and equipment at the right place at the right time, but also upon their continuation in action the right length of time. To win a battle, in other words, striking power must be supported by staying power."

Ideally, staying power is obtained by replacement of tired men with rested reserves. This is not always possible and at such times it is better to give the men a "benzedrine alert" than to risk losing not only the battle but the men themselves.

"One pill may be worth a B-17 and crew of 10 when the man who is flying it can no longer stay awake," General Grant points out.

Benzedrine, it should be understood, will not produce supermen and its practical value will be defeated if the men are denied proper rest after its use.

CHEMISTRY

Helium Used in Safer Magnesium Production

➤ AN IMPROVED method for the production of magnesium from its ores is the subject of patent 2,353,193, issued to Dr. Royd R. Sayers of the U. S. Bureau of Mines and assigned royalty-free to the government. Standard procedure for freeing magnesium from its oxides is to heat it with a carbonaceous material, which takes up the oxygen and releases the magnesium in vapor form.

To prevent the magnesium from re-oxidizing, hydrogen or some carbon-containing gas is usually introduced during the cooling process. This, however, forms dangerously explosive mixtures. Dr. Sayers substitutes the inert safety gas, helium, eliminating this difficulty. He also speeds the agglomeration of the cooling magnesium into droplets by subjecting the vapor to intense but inaudible supersonic vibrations.

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ASTRONOMY

Fremont Pass Observatory Highest in the World

See Front Cover

➤ HIGHEST permanent astronomical observatory in the world is the Fremont Pass Station of Harvard Observatory, pictured, snow adorned, on the front cover of this SCIENCE NEWS LETTER. It is located at Climax, Colorado, at the altitude of 11,500 feet. This station has the advantage of extremely clear skies and high atmospheric transparency. On moonless nights, stars are visible down to the seventh magnitude—stars only half as bright as those that can just be glimpsed under good conditions at sea level.

The station, however, has been devoted primarily to solar work. Artificial eclipses made inside of a telescopic device called the coronagraph enable the observer to record faint external surroundings of the sun that hitherto have been easily observed only at the time of total eclipse.

During the winter, the snow lies from six to eight feet deep on the level and may approach twenty feet in drifts. The unusual form of the "dome" is to facilitate the removal of snow from its surface. The climate of the station has been rather aptly described as consisting of nine months of winter and three months of poor skiing. Two local residents were heard in the following conversation: One of them said, "I missed summer this year, I was on the night shift that week." The reply was even more graphic: "You didn't miss much. It snowed both days."

Climax is thirteen miles from the famous mining town of Leadville, Colorado, which produced so many fortunes back in '79 and the early '80's. Fourteen-thousand-foot peaks abound in the region so that the observatory, despite its altitude, is still relatively low. Many astronomers have investigated the conditions for telescopic "seeing" from the tops of many Colorado peaks. The results were discouraging. Not only are the peaks frequently capped with clouds, but even when clear, the atmosphere above them is so turbulent that the images of stars boil and dance so actively that no satisfactory observations can be made. Apparently this condition is produced by currents of air ascending and descending over the peaks. Within the pass at Climax the flow is essentially stream-lined and the seeing is of excellent quality. The frequent snows and rains have their uses, for they serve to wash the air free from accumulated dust and produce a sky of a deep-blue color characteristic only of high altitudes.

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CHEMISTRY

Anti-Mosquito "Bombs" Can Be Used for Germs

➤ THE FREON GAS now being used successfully in "bombs" to fight mosquitoes in tropical regions can be used for fighting germs in the air of rooms, it appears from studies reported by Dr. Lyle D. Goodhue and Dr. E. R. McGovran, of the U. S. Department of Agriculture. (*Science,* June 23)

In warfare against mosquitoes the non-toxic non-flammable Freon gas, dichlorodifluoromethane, acts as solvent for the pyrethrum extract and sesame oil and furnishes the pressure and the energy to disperse the insect-killing chemical.

It can be used, with slight modification, to spray and disperse propylene glycol which has been found effective in killing many disease germs that spread through the air of offices, school rooms and the like closed spaces. For this purpose, the Department of Agriculture scientists find, ethanol must be added to the mixture of germ-killer and liquefied gas, since the propylene glycol is not very soluble in dichlorodifluoromethane.

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IN SCIEN

CHEMISTRY

German Lubricating Oils Show Few Signs of Decline

➤ GERMAN lubricating oils and greases captured in Africa and Italy, and subjected to analysis by a special group of chemists, show few signs of decline in quality, Capt. N. L. Klein states, (*Army Ordnance,* July-Aug.). The analyses do indicate, however, that there may be shortages in some of the petroleum raw materials taken for granted in American lubricating practice, for treated animal and vegetable fats and oils are substituted in the German products.

The analyses were made in industrial laboratories, with the cooperation of a joint committee appointed by the Society of Automotive Engineers and the American Petroleum Institute. Besides trying to get an estimate on the state of affairs in the German lubricants industry, the work was aimed at learning the uses to which captured enemy supplies may be put by our own forces, uncovering technical information of possible value to American industry, and ascertaining sources of crude oil and methods of refining.

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PUBLIC HEALTH

Infantile Paralysis Dimes To Be Used for Research

➤ MILLIONS of the dimes that were given by the mile to fight infantile paralysis, in honor of President Roosevelt's birthday, are to be used in research and education by 27 leading universities, laboratories and other organizations from coast to coast.

Grants totaling $1,128,770 made by the National Foundation for Infantile Paralysis were available July 1.

Three large grants provide for research over five years. University of Minnesota Medical School receives $320,000, Northwestern University Medical School is given $175,000 for basic research in physical medicine aimed at the disease, while $325,000 to the University of Michigan will allow field and laboratory investigations of infantile and related virus diseases.

Science News Letter, July 22, 1944

NE FIELDS

INVENTION

Absorbent Cellulose Powder Is Offered for Wounds

➤ A NEW KIND of dressing for wounds, an absorbent cellulose powder that is also mildly antiseptic, is offered by Julius Kent of New York City, for patent 2,353,243, rights in which are assigned to the Kent Chemical Corporation. Production is very simple. Cotton linters, ramie, cornstalk pith or some other relatively pure form of cellulose is soaked for about half an hour in a solution of orthoboric acid, which is afterwards dried at a temperature of from 80 to 140 degrees Centigrade and ground in a pebble mill.

Science News Letter, July 22, 1944

MEDICINE

Red Blood Cell Paste Speeds Healing of Ulcers

➤ RED BLOOD cells, an important by-product of plasma production, are now being made into a paste which speeds healing of old, infected burns, varicose and other ulcers, and extensive granulating wounds, Lieut. Clifford K. Murray and Capt. C. M. Shaar, of the Navy Medical Corps, report, (*Journal, American Medical Association,* July 15).

The red cell paste is applied directly to the wound after it has been cleaned, and is then covered with a sterile dry dressing. It is made by mixing red blood cell concentrate with a jelly of tragacanth and hexylresorcinol.

With 12 applications during two weeks, complete healing was achieved of a varicose ulcer that had persisted for 10 months and had been recurring over a period of 16 years. Similar good results were obtained in most of the other patients but the Navy doctors warn that the red cell paste is not a panacea for all chronically infected wounds. They believe it will be most successful in cases in which the slow healing is the result of local impairment of blood circulation. It would not be good for tuberculous or syphilitic ulcers, they point out.

The most plausible explanation of the healing action of the red cell paste is that it supplies required nutritional elements or proteins to tissues lacking them because of poor circulation of the blood.

The red cells are apparently absorbed to a certain degree by the tissues until the granulations reach the surface and a crust forms. This crust apparently serves as protection, source of nourishment and a scaffolding for the support of connective tissue. New skin extends over the surface of the wound under the crust and when the crust drops off, the surface is completely covered.

Science News Letter, July 22, 1944

PLANT PHYSIOLOGY

Rubber Yield Increased By Wounding Tips of Vine

➤ INCREASE in yield of rubber from the milkweed-related vine, Cryptostegia, is claimed on behalf of the method covered by patent 2,353,460, granted to John W. Haefele of Ridgewood, N. J. Customary way of harvesting rubber from this and certain other smaller rubber plants, like guayule, has been to grind whole masses of the vegetation in a ball or pebble mill. Where the rubber content is low, this becomes a rather expensive business, and may erase all profits. Mr. Haefele has discovered that wounding the tips of the Cryptostegia vine before cutting off the branches causes an accumulation of latex in the injured region, thereby increasing the harvest.

Patent rights have been assigned to the United States Rubber Company.

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CHEMISTRY

Experiments Show Effect Of Wax Sprays on Sunflower

➤ ENGINEERS needing to keep camouflage foliage green and fresh, drought-area farmers and gardeners everywhere, may benefit from research completed by Dr. C. L. Comar and Dr. C. G. Barr at the Michigan Agricultural Experiment Station on wax sprays to keep plants from withering before their time.

There is a great need for oil emulsion sprays that will keep the leaves from losing their moisture but not be poisonous in other ways. This requires separate tests for the effect on the leaves of each chemical considered for use in the spray. Much of this time-consuming work has now been done by the investigators on sunflower plants. Their research on chemicals and temperatures to be avoided will save time for others in perfecting the desired sprays.

Science News Letter, July 22, 1944

FORESTRY

Conservation Measures Taken to Save Pine Trees

➤ IN AN effort to get the most out of our dwindling supply of several western pine species, the Office of Price Administration requested lumber mills to manufacture lath in connection with lumber production. This measure was taken so that fuller use would be made of the logs, and that a minimum of the precious wood would go to waste.

Due largely to over-cutting and fires, the supply of western pine is far below normal. Lath made from slabs that would otherwise go to the burner will be used to manufacture boxes and crates needed for the shipment of war material, thus stretching the supply of wood for such purposes.

Science News Letter, July 22, 1944

MEDICINE

Penicillin May Be Inhaled As Pneumonia Treatment

➤ PATIENTS with pneumonia or other infections of the respiratory tract may in future get their penicillin by inhaling it through an oxygen mask, it appears from studies reported by Dr. Vernon Bryson, Miss Eva Sansome and Sidney Laskin, of the Carnegie Institution of Washington and the Long Island Biological Laboratory at Cold Spring Harbor, N. Y. (*Science,* July 14).

Penicillin, the scientists found, can be made into an aerosol by using a standard atomizer and compressed air. Compressed oxygen could also be used. Tests with a rabbit and mice showed that the penicillin particles in the aerosol do penetrate into the lungs where they could get to work directly on the germs causing the pneumonia. Penicillin remains unchanged chemically and does not lose its anti-germ activity when converted into an aerosol.

Since penicillin does not diffuse readily but is rapidly excreted, it is considered desirable to apply it directly to the site of infection whenever possible, in all but generalized infections. The inhalation method would make this possible in the case of respiratory tract infections. It might therefore make treatment more effective and save penicillin.

The first lot of penicillin used in the tests "had a distinct cheesy odor," the scientists report, but a subsequent allotment was virtually without odor and could be inhaled very comfortably.

Science News Letter, July 22, 1944

RADIO

Television, When and How

Post-war sets will benefit from advances in radio and radar. Expected to be a billion-dollar industry, with 83% of the people desiring receivers.

By ROBERT N. FARR

➤ TELEVISION may become a billion-dollar industry after the war. Surveys show that 83% of the people want television receivers in their homes.

A pent-up demand for between 20,000,000 and 25,000,000 radio sets will exist by the end of 1944, as compared with the industry's all-time high production of 13,000,000 units in 1941. Equipment producers are making plans now to offer a modern television set to the man who will need to replace his pre-war radio set.

It is still too early to foretell what post-war television will be like. Ten or 15 years of research work in the radio and electronics industry have been compressed into the 31 months since Pearl Harbor. Certainly it can be expected that many of the new inventions and developments in the field, such as radar, will be applied to television to make it better.

These improvements may be a long time in coming, so it is safe to assume that television immediately after the war will be very much like the television we had when the war started, with a few changes.

The manufacturing facilities for electronic devices made in war-time will be available for the production of television receivers and equipment. This means that the cost of equipment will be reduced. For example, the pre-war cathode-ray tube, the tube with a screen on which the television picture appears, cost $50 or $60; after the war the same tube will cost about $20.

Black and White

Pre-war television pictures had a disagreeable greenish cast, caused by the fluorescent screen of the cathode-ray tube. Wartime research has created a new fluorescent screen that overcomes the problem and gives a black-and-white picture almost as good as a newspaper halftone.

The flat cathode-ray tube, used in 1941, made it necessary for the viewer to stand directly in front of the screen in order to see the picture properly. A new rounded tube has been recently put into general use, throwing the picture on a curved surface. This rounded tube gives a clearer picture that may be viewed from any convenient angle.

There is actually only one major unsettled question concerning television. This is the matter of standards and frequencies. Upon the outcome of this question rests the kind of television we will have.

It all boils down to whether the 525-line screen (that is one with 525 lines in a 10-inch square) will be accepted as standard, or whether television will wait until the better 1000-line screen is perfected. Manufacturers who want to keep their product output as near to the war boom as possible want the 525-line screen, while broadcasters, who are interested in better reception and better pictures, want the 1000-line screen.

To get a better idea of what this means, imagine a sheet of paper 10 inches square, the size of the present television screen. The pictures are "painted" on the screen by streams of electrons, in varying shades of light and dark, in much the same way as a page is typed on a typewriter.

30 Pictures a Second

A new picture is painted 30 times a second, on 525 lines, each a fraction of an inch lower than the other. At the end of the 525th line, at the bottom of the screen, a new picture is started at the top of the screen.

By painting 30 new pictures each second, the viewer gets the same effect of motion as he would get by running 30 frames of movie film through a projector every second.

To get some idea of how fast the television pictures are painted, we can remember that the average typewritten page, single spaced, has 2,000 characters including letters and punctuation marks. One television picture has 260,000 characters, equal to 130 pages of typewriting.

The Bible contains 3,500,000 letters and punctuation marks. Television transmits that number of characters in half a second.

A 1,000-line screen for television has 585,000 characters, and is twice as clear and detailed as the 525-line screen.

In order to produce the 1,000-line picture, it will be necessary to alter completely the 525-line system, and use higher frequencies. This will mean that all receivers manufactured for 525-line television may become obsolete.

The question of standards and frequencies of post-war television is now being studied carefully by a committee of the Federal Communications Commission. Both the broadcasters and the manufacturers have agreed to abide by its decision. Upon the outcome of its investigation depends the kind of television we shall have after the war.

Cost Depends on Size

The cost of a television receiver depends largely upon the size of the screen, since the larger the screen the more tubes are required. The pre-war set with a 10-inch screen had 27 tubes for television reception only. After the war, it is expected that the sets will be equipped with 18- by 24-inch screens, large enough to be seen comfortably in the average living room.

The post-war receivers will cost from $125 for a table model, up to $500 or $600 for de luxe television-radio-phonograph combinations.

Today, there are nine television stations, operating in five major cities. In the areas they cover there are about 27,000,000 people. Plans are being made for a national television network, so that television programs may be available to an even greater audience. It is expected that this network, linking New York, Philadelphia, Washington and Charlotte, N. C.; Chicago, Terre Haute and St. Louis; Denver, San Francisco, Los Angeles and Phoenix will be in operation by 1950.

Television entertainment will include three types of programs. One is the studio presentation, that is, anything which is enacted in a studio with good lighting. Second is the outdoor event, picked up with remote television cameras. Such events as football games, rodeos, ice shows and boxing and wrestling matches will be presented. The third type of program is sound motion picture film. Many of the television programs being presented today use sound movies for their entertainment.

The ultimate commercial success of

TELEVISION ENTERTAINMENT—This picture of a fashion show being picked up by portable television cameras gives you a preview of what postwar television may be like. The coarse screen of the border, known to engravers as 55-screen, corresponds roughly with the prewar image; the finer center part (85-screen) is what we may look forward to. Of course, the dots of the engraver's screen are replaced by tiny lines on the television screen.

television is assured because of its value as an advertising medium. Many products can be advertised over television more effectively than in any other way.

Commercial advertisers are already presenting educational and entertaining programs. A beauty cream sponsors facial care lessons of interest to women; a soft drink presents a hillbilly show; a plastics manufacturer uses television to give the public a glimpse of his postwar products; and a maker of ammunition presents wildlife forecast of interest to sportsmen.

Several universities are planning extension courses, using television to bring the classroom into the home. Government-operated television stations may make it possible for people to see and hear Congress in action. Medical students will be able to witness surgical operations being performed in hospitals hundreds of miles away.

Television is destined to provide knowledge to larger numbers of people, truer perception of the meaning of current events, more accurate appraisal of men in public life, and a broader understanding of our fellow human beings.

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MEDICINE

Measles Preventive Free

Within a month, health departments in all states will have the globulin ready for distribution. Present supply to last five years.

➤ WITHIN a month, health departments can have for free distribution to children everywhere in the nation the measles preventive obtained as a by-product from blood donated by the American people to the Red Cross for our fighting forces.

Health departments will get the preventive, called immune serum globulin, on application to the American Red Cross, Washington, D. C. The plan for its distribution has been set up, and ample supplies of the globulin are on hand, ready to be packaged and shipped.

No charge for the preventive can be made to the patient getting it, the Red Cross stipulates. Neither can the manufacturers or anyone concerned with its production or distribution make any profit. The globulin comes from blood that was given by the American people out of their own veins and the Red Cross wants this valuable by-product to be distributed equally to all the states, so that all American children can have its benefit.

The costs of processing and shipping will be paid by the health department or other suitable agency to whom the Red Cross gives a permit for purchasing the material. The price for a vial containing enough globulin for one adult or two small children will be $1.07 to $1.10.

The measles preventive is separated from blood by a process developed by Dr. Edwin J. Cohn of Harvard in studies made under contract between Harvard and the medical committee of the Office of Scientific Research and Development. (See *SNL*, May 27 and June 24)

The globulin may be used in either of two ways: A full dose may be given to prevent measles attacking a person who has been exposed to it; or a smaller dose may be given so that the patient will get a light attack of measles. This last method is the one that probably will be favored for children because, although the child may be a little sick for a day or two, he will be spared the suffering of a severe attack and will be able to develop his own immunity or resistance to further attacks.

The reason why blood donations to the Red Cross contain the measles preventive is because about 90% of the grown-ups who are giving the blood have had measles and developed immune globulin in their blood as a result.

The present supply, the Red Cross estimates, should last about five years. So long as any immune globulin is available from the blood donated for the armed forces, it will be available free to the public. After the war when the surplus has been used up, the manufacturers who now process it for the Army, Navy and Red Cross will probably continue to make it on a commercial basis. The price then will probably be about $2.80 per child's size dose, judging from the present price of a similar substance that has been available commercially.

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Do You Know?

An up-to-date tannery is being erected in Western Australia to make leather of *sheep pelts,* a product formerly wasted.

Copper ammonium fluoride is used to *mildew-proof* such textiles as cotton, linen, jute, sisal and hemp.

The snows of Mexico's *"Sleeping Woman"* 17,338-foot volcano, are being harnessed by scientists for hydroelectric energy and irrigation.

Two varieties of California *lichens,* a tree trunk and rock encrusting plant, are now in demand by perfume manufacturers.

Mastitis, a disease of cows, annually renders 3,500,000,000 pounds of milk unfit for use, or 3% of total normal U. S. milk production.

Brazil's present wartime *mining boom* is producing principally iron ore, coal, manganese, quartz crystals, industrial diamonds, mica, nickel, and bauxite for aluminum.

Storage batteries in Army motorized equipment used on the Alaska Highway and in the Aleutians are protected against freezing in 40-below-zero temperatures by *mineral wool* insulation.

The milk of the *water buffalo* found in India is slightly bluish but is exceptionally rich and high in butterfat content; millions of these animals are used in India for milk, meat and work.

White Niagara grapes, introduced into Brazil from the United States, are reported to be yielding in that country attractive red grapes which in size, taste and shape are the same as the white.

New soap ingredient, a sulfonated product developed from *petroleum,* mixed with other constituents of soap, gives a material that can be used in any kind of water to remove dirt, oil or grease; it leaves no ring on the bathtub.

Hydrochloric acid, or anhydrous hydrogen chloride, of greater than 99% purity, is produced without explosion hazard by the use of *chlorosulfonic acid;* in the process where hydrogen and chlorine are burned together, explosions sometimes occur.

MEDICINE

Psychiatry Training

Medical schools throughout the country should give every physician a grasp of this valuable science. 50% of patients have psychiatric difficulties.

➤ REORIENTATION of training in medical schools throughout the nation to give every physician a grasp of psychiatry and put more emphasis on the person who lives inside the body was recommended as a measure to be included in any national civilian health program by Col. William C. Menninger, director of the neuro-psychiatry division, U. S. Army Medical Corps. His recommendation came in response to a question as he was testifying at a hearing of the U. S. Senate Subcommittee on Wartime Health and Education.

"Every physician should have an adequate grasp of psychiatry," Col. Menninger said, "because 50% of the patients going to a doctor have psychiatric difficulties."

There is a severe shortage of psychiatrists both in and out of the military services, he told the Committee.

"There are approximately 3,000 qualified psychiatrists in a total of 140,000 physicians in the United States," he said.

Other measures advocated by Col. Menninger to build mental health in the nation were a program of public education on mental health to remove the many bugaboos and misconceptions about mental illness that are widespread and a plan to make psychiatric advice available in general health clinics. Psychiatric treatment should be available in general hospitals just as skin specialists are, he said. Most communities do not have this sort of all-round treatment available.

Men who are discharged from the military services for neuropsychiatric reasons should have treatment and not a life pension, Col. Menninger advised, emphasizing, however, that he was expressing his own opinion as a physician and not voicing any policy of the Army.

The neuropsychiatric type of personality maladjustment, where symptoms are developed unconsciously to gain relief, aid or escape from an intolerable situation, is not helped by looking forward to an indefinite period of pension. The only way such a man will get well is to face the situation in an adult way and not by becoming a dependent.

Col. Menninger declared that he believes the neuropsychiatric to be just as genuinely disabled as the man who has a bullet through his leg. He is just as worthy of a pension. But it should be paid to him in a lump sum or some other way than as a pension coming to him month after month and year after year as long as his neurosis shall last.

"These men need treatment," Col. Menninger said, "and many of them can get well."

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ORNITHOLOGY

Birds Are Composers

➤ BIRDS ARE composers as well as musicians. Their songs have musical form and are therefore true music. These are the conclusions of Dr. Wallace Craig of the New York State Museum, as a result of a comprehensive statistical study of the song of the wood pewee.

A bird student from boyhood, a comparative psychologist, and an accomplished musician, Dr. Craig combines these attributes in his study of the wood pewee to produce, in the words of Dr. Charles C. Adams, emeritus director of the New York State Museum, "one of the most outstanding contributions to the study of bird songs in recent years in America."

Dr. Craig believes that the singing of birds is not entirely unconscious and unintelligent. "While the wood pewee is singing one phrase, he anticipates the next one; this is the beginning of musical composition. Birds give attention to sound as such and sometimes choose one sound in preference to another; this is a beginning of musical taste."

The wood pewee, a dull-colored, inconspicuous bird of the woods, is often to many people only a plaintive voice of an unseen singer. It has three songs:

an early morning twilight song of great beauty and of musical interest because it can be "described definitely and analyzed mathematically," a leisurely daytime song, and an evening twilight song.

Composed of three different phrases repeated hundreds of times in varying order, the twilight song is a continuous musical composition. Because the three phrases are easily identified, it was possible for 22 observers, working independently, to cooperate with Dr. Craig in a statistical study to determine the order of the succession of the phrases.

The wood pewee is the only wild bird, anywhere in the world, whose song has been observed cooperatively and analyzed statistically to determine the order of succession of the phrases and hence the musical structure of the song.

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MEDICINE

Growth Hormone May Be Tested by New Method

➤ AN ACCURATE, sensitive method for testing the potency of the pituitary growth hormone has been worked out by Dr. Herbert Evans, Dr. Miriam E. Simpson and Dr. Walter Marx, of the University of California.

The test is based on the fact that a cartilage disk on the end of one of the leg bones, the epiphyseal cartilage of the tibia, changes its width in proportion to the increase of weight of the young rat as it grows. The solution of the growth hormone to be tested is injected for four days in succession into an immature female rat from which the pituitary gland has been removed. At the end of the fifth day the tibia is dissected, split, and hardened with formalin. It is then treated with a silver solution, exposed to light, fixed, and washed, somewhat in the manner of a photographic film. The epiphyseal cartilage shows up as a white band which may be measured under the low-power microscope. Width of this band is proportional to amount and strength of the hormone, the scientists found.

Trial of the growth hormone is as yet limited to work with animals but standardization of a test for potency is one of the necessary steps before any hormone can be used clinically on humans, Dr. Evans pointed out.

The cartilage test is 11 times as sensitive as measuring the growth-promoting qualities by means of increase in body weight of the animals.

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BOMB RACK IN WINGS—The 13th Air Force Service Command in the South Pacific has produced a more versatile and powerful P-38 Lightning plane by designing the external wing bomb rack seen in this official U. S. Air Forces photograph.

PUBLIC HEALTH

Polio Cases Increase

➤ INFANTILE paralysis cases increased in five states during the week ending July 8, reports received by the U. S. Public Health Service in Washington show. For the nation as a whole, excluding Rhode Island from which no report was received, there were 289 cases, compared with 222 the previous week and 244 for the corresponding week of last year.

Dr. Charles Armstrong, one of the U. S. Public Health Service's experts on infantile paralysis, has returned from North Carolina, where he went at the request of the state health officer. North Carolina is having the worst of the current epidemic and is suffering from a shortage of physicians. This state reported 94 cases for the week ending July 8, 84 the previous week, and a total of 269 so far this season.

All infantile paralysis patients in the state are being hospitalized. At Hickory, center of the outbreak, a nearby boys' camp was rapidly converted into a hospital. Red Cross nurses are on the job, there are plenty of respirators, and the children are getting the Kenny treatment. Dr. Armstrong praised the way in which state and local health authorities, assisted by the Red Cross, the Army and the National Foundation for Infantile Paralysis, have been handling the

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situation. The patients are getting good care, Dr. Armstrong said, and the fact that hospital care is being made available to all of them is enabling many to get attention much earlier than they otherwise might, especially with doctors scarce. Because of the physician shortage, the U. S. Public Health Service has arranged for its emergency health and sanitation service doctor and nurses to assist state authorities if needed.

Next largest number of infantile paralysis cases were reported from New York State, which had 34 the week ending July 8, compared with 25 the previous week. Cases increased from six to 26 in Pennsylvania, from 6 to 14 in Virginia, and decreased from 29 to 28 in Kentucky.

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BACTERIOLOGY

Nervous System Diseases May Get Serum Treatment

➤ HOPE that serum treatment for nervous system diseases caused by viruses, such as infantile paralysis, might become effective appeared in studies reported by Dr. Charles A. Evans, of the University of Minnesota, Dr. Howard B. Slavin and Dr. George P. Berry, of the University of Rochester.

Failure of serum treatment against infantile paralysis in the past has been explained as due to the blood-brain barrier. The antibodies which might fight the virus may develop or be injected into the blood but are ineffective because they cannot pass this barrier to get at the virus in the brain and nervous system, is the theory.

Working with a different kind of virus, the herpetic virus that attacks the nervous system of mice, Dr. Evans and associates found that anti-herpetic serum did retard the progress of the virus through the nervous system and in some cases arrested it altogether.

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BOTANY

NATURE RAMBLINGS by Frank Thone

Perennial Calumny

➤ GOLDENROD is in bloom again, and over wide stretches of the American landscape resound the agonized sneezes of hay-fever sufferers. Because the two things happen at approximately the same time and often in the same places, it is widely assumed that the goldenrod is responsible for the sneezes.

That too-easy assumption of a causal connection works a gross injustice on a group of our most beautiful late-summer wildflowers. For the real villains in the piece, responsible for easily nine-tenths of summer and fall hay fever, are the ragweeds. Ragweed pollen is hundreds of times as abundant in the air as goldenrod pollen, and grain for grain is much more irritating to most sensitive noses.

The case is complicated by the fact that the goldenrod is not utterly innocent. Allergists have found that its pollen does cause some hay fever cases. However, their number is quite insignificant as compared with the huge army of sufferers from the effects of ragweed pollen.

Moreover, it is possible for a victim of the ragweed dust to bring on an attack of sneezes and smarting, watery eyes by walking through a patch of goldenrod. The pollen that sets him off will be of the genuine ragweed variety, that has fallen on the foliage and flowers of the goldenrod, and is then stirred into the air again by the disturbance. How is the poor, unsuspecting hay-fever victim to know that the goldenrod also is a victim, with incriminating evidence "planted" on it?

Goldenrod has the further disadvantage of being frequently found in bad company. Unfortunately, the same fertile, well-drained soils, with open, sunny exposure that the most abundant goldenrod species prefer are favorable also for the growth of the ragweeds. So it is nothing uncommon to find bright masses of goldenrod and the dark, rank phalanxes of the ragweeds standing side by side.

A final misfortune of the goldenrod lies in the very beauty of its bloom. Most of us think of flowers in terms of bright, conspicuous corollas. Goldenrod flowers have them; ragweed flowers do not. So we see the brightly clad innocent bystander and give it the blame, while the green-camouflaged poisoner of the air escapes detection.

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INVENTION

Ships Unloaded Faster by Cargo Handling Apparatus

➤ QUICKER unloading of ships in war ports is promised by a newly patented apparatus, the invention of an officer in the U. S. Army, Col. James A. Dorst, on which U. S. patent 2,353,135 has been assigned, royalty-free, to the government.

The device consists of an endless belt mounted on a frame with suitable rollers or pulleys at either end. This can be lowered through the hatchway of a ship by means of a derrick. At intervals, the belt carries transverse rows of well-braced arms or rods, each series forming a kind of slotted shelf. From the edges of the decks adjacent to the hatchway, similar slotted shelves are thrust, so that the moving shelves pass through them. Any box or other package pushed out on one of these shelves will thus be picked up and lifted clear of the upper deck, and when it passes over the top of the apparatus it will be dumped onto a skidway or roller conveyor.

Run in reverse, the apparatus can of course be used for rapid loading of the ship.

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• First Glances at New Books •

➤ FAR ISLANDS are of much more interest to us nowadays than they were a few years ago. It is to be expected, therefore, that Cora DuBois's THE PEOPLE OF ALOR will attract a much wider audience than the cultural anthropologists who might otherwise have been its only readers. About half the book is taken up with autobiographies of notables among the Alor natives—genealogist, prophet, interpreter and so on—whose stories bring into sharper focus the impulses, fears and other life-shaping motives given general discussion in the first part of the text. (*Univ. of Minn.*, $7.50).

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➤ A CURE in a delinquent of "that sneering sullenness, that arrogant aggression, that Storm Trooper mentality" characteristic of the psychopath, is claimed for the technique of hypnoanalysis, in an unusual case history from the United States Penitentiary at Lewisburg, Pa. The book is REBEL WITHOUT A CAUSE; the Hypnoanalysis of a Criminal Psychopath, by Robert M. Lindner. (*Grune*, $4).

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➤ ENCOURAGEMENT and a challenge to educators appear in BEHAVIOR CHANGES RESULTING FROM A STUDY OF COMMUNICABLE DISEASES by John Urban (*Teachers College, Columbia University*, $1.85). Senior class high school biology students, Dr. Urban found, did change their behavior significantly with regard to hygienic practices as a result of what they learned in the class. Similar desirable behavior changes in other fields, such as nutrition, may be achieved, the author suggests. He emphasizes, however, that the teaching must be designed specifically for the purpose.

Science News Letter, July 22, 1944

➤ A TEXTBOOK for students of physics, chemistry, and engineering which has stood the test of time in use in many technical schools is HEAT AND THERMODYNAMICS, by Mark W. Zemansky (*McGraw*, $4). It is a second edition of a previous publication with some of the older material rewritten to bring it up to date.

Science News Letter, July 22, 1944

➤ A SYSTEMATIC and complete review of the concepts of modern physics is given in PHYSICS OF THE 20TH CENTURY, by Pascual Jordan, translated into English by Eleanor Oshry. It provides an analytical picture of the growth of physics and its relation to cosmic and biological processes. (*Philosophical Lib.*, $4).

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• Just Off the Press •

BEHAVIOR CHANGES, RESULTING FROM A STUDY OF COMMUNICABLE DISEASES—John Urban—*Teachers College, Columbia Univ.*—110 p., $1.85.

CHEMICAL MACHINERY: An Elementary Treatise on Equipment for the Process Industries—Emil R. Riegal—*Reinhold*—583 p., Illus. $5.

CHIANG KAI-SHEK: Asia's Man of Destiny—H. H. Chang—*Doubleday*—375 p., illus. $3.50.

FATS — OILS — DETERGENTS: A Looseleaf Abstract Service—*Interscience*, illus, $36 per year. Binder $3. First year, 1944, 12 issues.

GET IN SHAPE—Ida Jean Kain—*McKay*—94 p., illus., $1.

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REBEL WITHOUT A CAUSE: The Hypnoanalysis of a Criminal Psychopath—Robert M. Lindner—*Grune*—296 p., $4.

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Science News Letter, July 22, 1944

MEDICINE

New Germ Killer

May be a weapon against typhoid fever, dysentery and infected wounds and burns. Called, streptothricin, it comes from a microbe that lives in the soil.

➤ A POSSIBLE weapon against typhoid fever, dysentery and infected wounds and burns is seen in streptothricin, a germ-killer from a microbe that lives in the soil. Studies pointing to this were reported by Dr. Harry J. Robinson, Otto E. Graessle and Miss Dorothy G. Smith, of the Merck Institute for Therapeutic Research (*Science*, June 30).

Streptothricin was discovered in 1941 by Prof. Selman A. Waksman and Dr. H. B. Woodruff, of Rutgers University and the New Jersey Agricultural Experiment Station. So far, however, very little has been reported on its effect in animals or its toxicity.

So far as toxicity is concerned, mice were not harmed by 10 to 12 times the effective dose when streptothricin was given by mouth or by hypodermic injections under the skin, the Merck investigators report. Given by injection directly into the veins, however, this amount killed some of the animals.

"Mice heavily infected with a variety of gram-negative organisms," the scientists report, "are completely protected by the administration of small amounts of streptothricin."

The drug is less effective when given by mouth than when injected, but doses by mouth greatly reduce the number of lactose-fermenting bacteria in the intestinal tract. This similarity to certain sulfa drugs suggests that streptothricin may be of value in bacillary dysentery and typhoid.

Its marked action in test-tube experiments against both gram negative and gram positive organisms, together with the fact that body fluids apparently do not inhibit the drug's action, suggest it might be of value in infected wounds and burns.

Science News Letter, July 22, 1944

MEDICINE

Oil of Eucalyptus Tree Fights Malaria in China

➤ OIL from the leaves of eucalyptus trees is being used to fight malaria in China, according to a report received by the Chinese News Service.

The eucalyptus oil is used instead of kerosene or crude oil, difficult to obtain in China under war conditions, to destroy malaria-carrying mosquitoes in their breeding places. Dr. Liu Chung-lo, professor at the National Tsing Hua University in Kunming, reports that he has found the eucalyptus oil far more effective for this purpose than either kerosene or crude oil.

In order to develop a process which can be used in rural areas, Dr. Liu is using the most primitive equipment in his distillation process for obtaining the oil from the leaves.

Science News Letter, July 22, 1944

•New Machines and Gadgets•

⚙ *TRANSPARENT plastic pill boxes with a dozen separate compartments completely protect sulfadiazine tablets for soldiers from moisture and air. A wounded man can open the box with his teeth if necessary.*

Science News Letter, July 22, 1944

⚙ *WEATHERCASTER, to predict fair weather or rain, is a cardboard instrument with four raised, lettered dials of different sizes that may be rotated independently on the same center. Dials are set respectively to wind direction, barometer reading, directional trend of barometer, and present weather conditions. A code number then indicates the weather prediction.*

Science News Letter, July 22, 1944

⚙ *BARK from pulpwood logs is now removed by a machine which utilizes jets of water under high pressure. The method saves 10% of the wood, it is claimed, and eliminates hand-cleaning and finishing required in the older barking process.*

Science News Letter, July 22, 1944

⚙ *ALTERNATING electric currents can be changed to direct currents by an apparatus which has just been patented. The apparatus is operated by a small motor and is claimed to be almost 100% efficient. This rectifier is suitable for both light and very heavy direct current consumptions.*

Science News Letter, July 22, 1944

⚙ *STEEL-BRISTLED brush, cup-shaped and power-driven, rapidly cleans*

steel surfaces of scales, rust and dirt, prior to repainting. Operating in, and driven by, a portable hand tool, the brush spins at 4200 revolutions per minute. The picture shows it in operation.

Science News Letter, July 22, 1944

⚙ *FLOOR-SWEEPING magnet, mounted on an apparatus resembling a lawnmower, picks up nails, screws, washers and iron scraps from factory floors. The 18-inch revolving drum is permanently magnetized, so that no connecting electric cables are necessary.*

Science News Letter, July 22, 1944

⚙ *ELECTRIC water light, recently patented, may be dropped from an airplane into water without injury. It quickly comes to the surface right side up, automatically lights itself and floats as a guide for the plane. In storage it is kept in an inverted position.*

Science News Letter, July 22, 1944

⚙ *STRIP of matches wrapped around the cigarettes between the inner and outer coverings of the package keeps matches ever-present. This unique package is claimed to be safe.*

Science News Letter, July 22, 1944

⚙ *CYLINDRICAL-SHAPED electric razor departs from the ordinary form in that the side of the cylinder touches the skin. The motor is in the slightly enlarged handle end. The rotating cutting edge shaves with a draw cut.*

Science News Letter, July 22, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 217.*

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